Roe (John O.)

AN ELECTRIC NASAL SAW.

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REPRINTED FROM

The New York Medical Journal

for February 4, 1888.

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The instrument herewith presented is a nasal saw, which I have devised to be worked by an electric motor. The mechanical construction of this device is illustrated by the accompanying figures.

In Fig. 1 is shown a view of the complete instrument, which consists essentially of the reciprocating plunger P, carrying the nasal saw X, which is firmly held at the end of the plunger by the clamp O, drawn tightly around the end of the saw by means of thumb-screws. This plunger moves in the shell B, to which is attached the shield A.

Fig. 2 represents the interior of the shell B, and the mode in which the shield A is attached to it. The interior of the shell is cylindrical, with the rectangular opening P in the upper end. The hollow shield A is inserted into the lower end of the shell, forming the step *a*.

In Fig. 3 is represented the mode in which the plunger is fitted in the shell already described.

The construction of the plunger itself is shown in Fig. 4. The end of the plunger P, which carries the saw, is rect-

* Read before the American Laryngological Association at its ninth annual congress, May 26, 1887.

angular, as shown in the cross-section (Fig. 5), and fits nicely into the correspondingly shaped opening P (Fig. 2) in the upper end of the shell B, in which it is permitted to slide forward and backward. The rest of the plunger P is cylindrical and is nicely fitted to the interior of the shell B, which thus acts as a guide to steady the motion of the plunger, and which is bored out longer than the plunger to allow space for the length of the stroke or travel of the plunger. The cylindrical end of the plunger (Fig. 4) P is bored out so as to receive the revolving cylinder C (Fig. 6), which is formed on the end of an ordinary drill shank D. This cylinder has a shoulder near the end where the shank D is attached to it, and this shoulder forms a bearing which is supported by and revolves on the step *a* (Fig. 2), already referred to.

Near the shoulder a small groove is turned in the cylinder C, so as to receive the point of the screw *s* (Fig. 3), which passes through the shell B, thus preventing any longitudinal movement of the cylinder, but permitting it to revolve freely.

Near the middle portion of the cylinder C is the spiral groove *c*, which is formed around it and which returns upon itself, thus forming a cam in the surface of the cylinder. When the cylinder C is inserted in the plunger P, the small screw T (Fig. 3), whose head is completely beneath the surface of the plunger, has its point projecting into the groove or cam *c*, just described.

To operate the saw it is simply necessary to slip the socket A on the end of a dental drill and attach the shank D to the cable by means of the ordinary chuck, the shank being shaped so as to fit the chuck. If now the cable is revolved by means of a motor of any kind, it is evident that the cylinder C will revolve in the plunger P, and the groove or cam *c* will force the screw T to travel forward and back-

ward, carrying the plunger P and the saw X with it, thus giving the latter a reciprocating movement, the rapidity of which can be regulated by the speed of the motor.

The whole arrangement is simple and compact. It can be attached to the handle of the dental drill in a moment, and, if properly made, of good material, it will not get out of order with any ordinary usage, as all springs are avoided, and the operation is positive in every particular.

The superiority of the saw, in nearly all cases, over other devices for the removal of bony growths or bony deformities of the nasal passages, and especially of the nasal septum, has been very clearly and ably shown by Dr. Bosworth.*

Its marked superiority consists in its leaving, if properly manipulated, an even and smooth surface, and therefore no irregularities in which secretions may accumulate and become inspissated, as is often the case after the use of burrs or drills.

There are two advantages possessed by this saw propelled by electric power instead of by the hand. They are the greater accuracy and rapidity with which the operation can be done.

There are two blades attached to this saw—one straight, and one set at an angle, as shown in the cuts.

The object of the angular blade is to throw the body of the saw and the hand below the line of vision, so as not to obstruct the view of the blade while operating.

In using the hand-saw it is difficult to make the to-and-fro movement of the hand so steady and uniform as not to displace the blade of the saw, particularly in starting it; but with this saw, propelled by power, it can be held in the hand firmly and steadily at the exact spot where it is

* "Med. Record," New York, January 29, 1887, vol. xxxi, p. 115.

wished to cut, the motor being started and stopped by simply closing and opening the current by means of a push-button placed on the floor and controlled by the foot.

It is seen that each revolution of the motor gives the blade of the saw a backward and forward movement, so that a speed of fifteen hundred or two thousand revolutions gives the blade a corresponding number of strokes. It can be at once seen that a bony projection which will require a considerable period of time to cut through with the hand-saw can with this device be cut through very quickly.

The length of time required in some cases to cut off a hard bony outgrowth with the hand-saw is often an objection to its use, for not unfrequently patients have fainted, not on account of pain, for that can be entirely prevented by the use of cocaine, but on account of the mental association or unpleasant sensations produced by the vibrations of the saw. This is entirely avoided by the rapidity of the action of the electric saw, and the quickness with which the operation can be performed.

It might be feared that this rapidity would endanger the cutting of parts not intended to be cut. This is not to be feared, for the hand of the operator can be so firmly secured or rested against the face or upper jaw of the patient as to give him the greatest security and accuracy in controlling the blade of the saw. Also, the saw can be stopped almost immediately by breaking the current to the motor.

The application of the surgical engine or motive power to nasal surgery is due to Dr. Goodwillie,* and in some operations in the nose his revolving knives, nasal drills, and burrs are superior to any other instrument devised. So

* "Extirpation of the Bones of the Nose and Mouth by the Aid of the Surgical Engine." "Med. Record," New York, July 12, 1879, vol. xvi, p. 28.

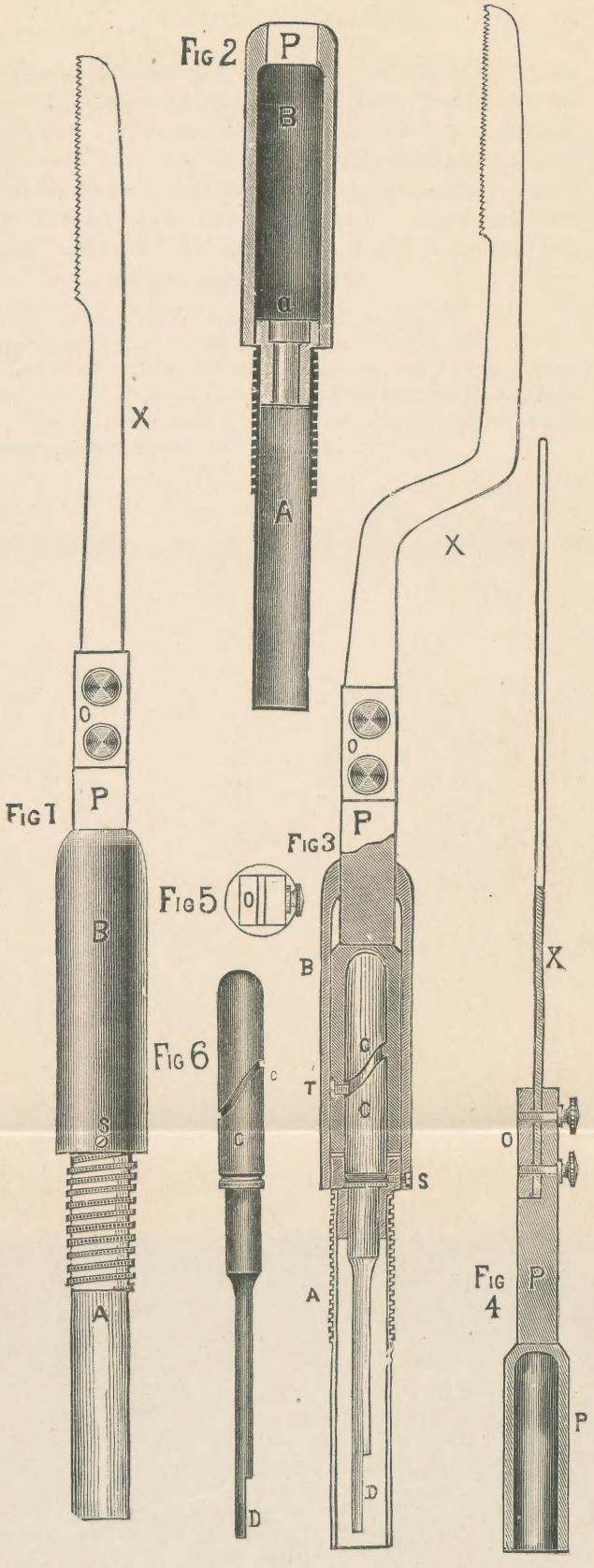
Fig 2
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are the nasal trephines devised by Dr. Curtis,* and the nasal drills and nasal planes devised by Dr. Jarvis; † but for the removal of redundant bone tissue from the nasal passages, and especially from the septum narium, where the surfaces should be left smooth and straight, a perfectly and rapidly working nasal saw, propelled by a motor easily and quickly controlled, like the electric motor, is *par excellence* the instrument to be employed. ‡

* "New York Medical Journal," vol. xiv, 1887, p. 596.

† "Medical Record," New York, 1887, vol. xxxi, p. 408.

‡ This electric nasal saw has been made for me by Chr. E. A. Gronbech, 205 East Thirty-fourth Street, New York. I use the Challenge motor, which is also made by him. This is run by a Gibson storage battery, which is charged with the Edison current.

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